Abstract

An adaptive equalizer finite impulse response (FIR) filter for high-speed communication channels with modest complexity, where the filter is iteratively updated during a training sequence by a circuit performing the update:

 $\overline{h}(t+1) = \overline{h}(t) + \mu[\operatorname{sgn}\{d(t)\} - \operatorname{sgn}\{z(t) - Kd(t)\}]\operatorname{sgn}\{\overline{x}(t)\}$, where $\overline{h}(t)$ is the filter vector representing the filter taps of the FIR filter, $\overline{x}(t)$ is the data vector representing present and past samples of the received data x(t), d(t) is the desired data used for training, z(t) is the output of the FIR filter, μ determines the memory or window size of the adaptation, and K is a scale factor taking into account practical limitations of the communication channel, receiver, and equalizer. Furthermore, a procedure and circuit structure is provided for calibrating the scale factor K.